

CLAIMS:

1. A time measurement system for measuring the delay between first and second signals, the system comprising event-detection means for providing event data
5 representing the times of upcrossings when the first signal crosses a predetermined level with a positive slope and the times of downcrossings when the first signal crosses said predetermined level with a negative slope, and delay-determining means operable to use the event data to define respective staggered segments of the second signal associated with said upcrossings and downcrossings, to sum said segments and
10 to detect a predetermined feature in said sum, the position of said feature representing the delay between the first and second signals.
2. A system as claimed in claim 1, wherein the predetermined level differs significantly from the average value of the first signal.
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3. A system as claimed in claim 1 or 2, including a wireless communication link operable to transmit said event data to said delay-determining means.
4. A system as claimed in any preceding claim, wherein said feature is a peak, the
20 extreme value of which has a position representing the delay.
5. A system as claimed in claim 4, including means responsive to the amplitude of said extreme value for providing a signal indicative of the reliability of the measured delay.
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6. An object detection system comprising a time measurement system as claimed in any preceding claim for measuring a delay associated with a signal received from an object to enable calculation of the range or bearing of the object.
- 30 7. An object detection system as claimed in claim 6, comprising a signal generator for generating said first signal, an interrogating signal transmitter for

transmitting an interrogating signal derived from said first signal and a receiver for receiving a reflection of the interrogating signal from an object and for generating said second signal in response thereto.

- 5 8. An object detection system as claimed in claim 7, including means defining a substantially zero-delay signal path between the event-detection means and the delay-determining means, to enable detection of a zero-delay point, the delay determining means being operable to calculate said delay from the relative position of said feature and the zero-delay point.

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9. An object detection system as claimed in claim 6, including first and second receivers for receiving signals from an object and, in response thereto, generating said first and second signals.

- 15 10. A time measurement system for measuring the delay between first and second signals appearing at locations which are remote with respect to each other, comprising a device at each said location and a wireless communication link therebetween, at least a first device being operable to transmit via said link event data representing the times at which predetermined events occur within the first signal, and at least a second
20 device being operable to receive the event data, to use the event data to define respective staggered segments of the second signal, to combine said segments and to detect a predetermined feature in said combination, the position of said feature representing the delay between the first and second signals.

- 25 11. A method of measuring the shift between first and second signals, the method comprising determining the events at which the first signal level rises above and falls below a predetermined threshold level which differs significantly from the average value of the first signal, combining segments of the second signal which are staggered by the intervals between said events, and detecting the position within the
30 combination of a peak value, said position representing said shift.